

Remarks

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1-48 are pending in the application, with claims 1, 17, and 33 being the independent claims. As indicated by the Examiner, claims 12-16, 28-32, and 44-48 recite allowable subject matter. (*See the Office Action at p. 11, ¶¶ 7-8.*) Claims 1, 17, 31-33, and 46-47 are sought to be amended. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicant respectfully requests that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Objection to the Claims

The Examiner objected to claims 1 and 33 for allegedly including informalities. In particular, the Examiner alleges that, in line 7 of claim 1 and in line 13 of claim 33, the phrase “may be” constitutes optional language that does not further limit these claims. In addition, the Examiner objects to the phrase “the buffer memory” in line 13 of claim 33 because it is allegedly unclear whether this limitation refers to the “input buffer memory,” the “output buffer memory,” or both. Although Applicant does not necessarily agree with these objects, claims 1 and 33 have been amended to expedite prosecution. Accordingly, Applicant respectfully requests that the objections to claims 1 and 33 be reconsidered and withdrawn.

Rejections under 35 U.S.C. § 102

The Examiner rejected claims 1, 2, 8-11, 17, 18, 24-27, 33, 34, and 40-43 under 35 U.S.C. § 102(e) as being allegedly anticipated by U.S. Patent No. 6,401,147 to Sang *et al.* (“Sang”). Based on the foregoing amendments and the following remarks, Applicant respectfully traverses.

As currently amended, claim 1 recites an apparatus comprising:

a buffer memory of a first type to store data associated with a connection identifier corresponding to a channel in a network, the data being organized into at least one chunk based on a linked list, the connection identifier identifying a connection in the channel, the data being part of a data stream associated with the connection; and

a packet memory of a second type coupled to the buffer memory and configured to store a chunk data block in response to a transfer condition, wherein the chunk data block includes a first data portion from a first chunk of the at least one chunk and a second data portion from a second chunk of the at least one chunk.

Sang does not teach or suggest each and every feature of claim 1. For example, Sang does not teach or suggest “a packet memory of a second type ... configured to store a chunk data block in response to a transfer condition, wherein the chunk data block includes a first data portion from a first chunk of the at least one chunk and a second data portion from a second chunk of the at least one chunk.” Although Sang appears to teach that frame data may be written to an external memory **36** (*see* Sang col. 8, ll. 17-20), Applicant cannot find any teaching or suggestion in Sang that the frame data written to external memory **36** comprises “a first data portion from a first chunk of the at least one chunk and a second data portion from a second chunk of the at least one chunk,” as recited in claim 1.

The differences between the apparatus recited in claim 1 and the teachings of Sang are significant. For example, the Specification of the instant application explains that

[t]he individual data chunks 314, 324_I, to 324_K are collapsed, or combined, into larger chunks with appropriate size for burst write to the packet memory 230. By combining the chunk data blocks into larger chunks, the data transfer rate from the input buffer memory 220 to the packet memory 230 can be significantly improved using the burst write mode.

(Specification at p. 8, ll. 6-10.) Thus, the Specification of the instant application teaches that the claimed apparatus can achieve improved data transfer rates compared to an apparatus that does not combine data into chunks that include “a first data portion from a first chunk of the at least one chunk and a second data portion from a second chunk of the at least one chunk.”

Because Sang does not teach or suggest each and every feature of claim 1, this reference cannot anticipate claim 1. Independent claim 17 (which is a method claim corresponding to the apparatus recited in claim 1) and independent claim 33 (which is a system claim corresponding to the apparatus recited in claim 1) have been amended to recite similar claim features to independent claim 1. Accordingly, independent claims 17 and 33 are patentable over Sang for at least the same reasons as independent claim 1, in addition to their own respective features. Thus, Applicant respectfully requests that the Examiner’s rejection of independent claims 1, 17, and 33 under 35 U.S.C. § 102(e) be reconsidered and withdrawn.

Dependent claims 2 and 8-11, dependent claims 18 and 24-27, and dependent claims 34 and 40-43 depend, either directly or indirectly, from independent claims 1, 17, and 33, respectively. Accordingly, dependent claims 2, 8-11, 18, 24-27, 34, and 40-43

also cannot be anticipated by Sang for at least the same reasons as set forth above with respect to the independent claims, in addition to the respective features of the dependent claims. Thus, Applicant respectfully requests that the Examiner's rejection of dependent claims 2, 8-11, 18, 24-27, 34, and 40-43 under 35 U.S.C. § 102(e) be reconsidered and withdrawn.

Rejections under 35 U.S.C. § 103

The Examiner has rejected claims 3-7, 19-23, and 35-39 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Sang in view of U.S. Patent No. 6,542,502 to Herring *et al.* ("Herring"). Based on the foregoing amendments and the following remarks, Applicant respectfully traverses.

As set forth above, Sang does not teach or suggest each and every feature of independent claims 1, 17, and 33. The shortcomings of Sang with respect to the independent claims are not remedied by the teachings of Herring. For example, like Sang, Herring also does not teach or suggest "a packet memory of a second type ... configured to store a chunk data block in response to a transfer condition, wherein the chunk data block includes a first data portion from a first chunk of the at least one chunk and a second data portion from a second chunk of the at least one chunk," as recited in claim 1.

Herring is directed to "a replication method" that solves the "deadlock" problem that occurs in "wormhole routing multicast methods." *See* Herring at the Abstract; col. 1, ll. 9-10. According to Herring, "[i]n wormhole routing, flow control is performed on units that are smaller than packets: flow-control digits, or 'flits'." *See* Herring col. 1, ll.

11-12; FIG. 1. Herring describes the deadlock problem associated with wormhole routing in the following manner:

The header (first flit) of the packet advances immediately through each switching element (switch) unless it is blocked because of contention for an output port. . . When the packet header is blocked, all flits of the packet are buffered in place until the output port is free. Thus, a single blocked packet may be blocked in place across many switches.

Herring col. 1, ll. 15-23.

To solve this deadlock problem, Herring uses a distributed memory machine from IBM, called an IBM SP2 (RISC System/6000 Scalable POWERparallel System). See Herring col. 2, ll. 22-68. Although Herring describes a data chunking method (see Herring col. 3, ll. 6-22), the IBM SP2 is equipped with only a single central buffer, not “a buffer memory of a first type” and “a packet memory of a second type” as recited in claim 1. Thus, Herring does not teach or suggest, for example, “a packet memory of a second type . . . configured to store a chunk data block in response to a transfer condition, wherein the chunk data block includes a first data portion from a first chunk of the at least one chunk and a second data portion from a second chunk of the at least one chunk,” as recited in claim 1.

Furthermore, Herring tends to teach away from using “a buffer memory of a first type” and “a packet memory of a second type,” as recited in claim 1. Herring acknowledges a drawback associated with the IBM SP2, specifically stating that

[b]ecause there is no assurance that the central buffer can store an entire multideestination packet, the central buffer as implemented in SP2 cannot guarantee to prevent [sic] multicast deadlock.

Herring col. 2, ll. 42-45. Despite this drawback, Herring advocates using only a single central buffer because “an SP2-like shared central buffer is an extremely attractive resource for packet replication.” Herring col. 2, ll. 45-46. Thus, Herring teaches a method that is implemented in a single central buffer — not “a buffer memory of a first type” and “a packet memory of a second type,” as recited in claim 1.

Because Sang and Herring, alone or in combination, do not teach or suggest each and every feature of claim 1, this claim is patentable over Sang and Herring.

Independent claims 17 and 33 are also patentable over Sang and Herring for at least the same reasons as set forth above with respect to claim 1, in addition to their own respective features. Dependent claims 3-7, dependent claims 19-23, and dependent claims 35-39 depend, directly or indirectly, from independent claims 1, 17, and 33, respectively. Accordingly, dependent claims 3-7, 19-23, and 35-39 are patentable over Sang and Herring for at least the same reasons as the independent claims, in addition to their own respective features. Thus, Applicant respectfully requests that the Examiner’s rejection of claims 3-7, 19-23, and 35-39 under 35 U.S.C. § 103(a) be reconsidered and withdrawn.

Conclusion

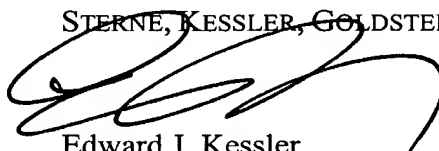
All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicant believes that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will

expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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Date: 30 Nov. 2006

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